Claims

1. Process for producing a biocatalyst with a biologically active material, introduced into a gel of polyvinyl alcohol, in the form of microorganisms, enzymes, spores and/or cells with the process steps

   a) Use of an aqueous polyvinyl alcohol solution with a degree of hydrolysis of ≥ 98 mol %.

   b) The addition of an additive that is dissolved in the aqueous polyvinyl alcohol solution and forms a separate, finely distributed and aqueous phase after concentration of the solution.

   c) Addition of the biologically active material.

   d) Dehydration of the aqueous solution to a maximum residual water content of 50 wt.% in order to cause the phases to separate and hence the polyvinyl alcohol to gel.

   e) Rehydration of the polyvinyl alcohol in an aqueous medium.

2. Process according to Claim 1, in which the polyvinyl alcohol solution has a concentration of 4 - 30 wt.%, preferably 6 - 16 wt.%.

3. Process according to Claims 1 and 2, in which a water-soluble additive is used which has an affinity to water at least similar to that of the polyvinyl alcohol.

[Stamp:]
Revised sheet
IPEA/EP

4. Process according to Claims 1 to 3, in which the water-soluble additive is selected from the group cellulose esters, cellulose ethers, starch esters, starch ethers, polyalkylene glycol ethers, polyalkylene glycols, long-chain alkanoles ($n \geq 8$), sugar esters and sugar ethers.

5. Process according to Claim 4, in which polyethylene glycol is used as a water-soluble additive.

6. Process according to Claims 1 to 5, in which the water-soluble additive is used in a concentration of 4 - 20 wt.%, preferably 6 - 10 wt.%.

7. Process according to Claims 1 to 6, in which the dehydration of the aqueous solution is carried out until a residual water content of at least 10 wt.% is reached.

8. Process according to Claim 7, in which the dehydration of the aqueous solution is carried out until a residual water content of 10 - 30 wt.% is reached.

9. Process according to Claims 1 to 8, in which the dehydration process is carried out after dripping the solution onto a hard surface.

10. Process according to Claims 1 to 9, in which the dehydration process is carried out after pouring the solution into a form.

[Stamp:]
Revised sheet
IPEA/EP

11. Process according to Claims 9 and 10, in which the dripping or pouring is carried out in such a way that the gel substance is formed with a diameter at least double its height.

12. Process according to Claim 11, in which the dripping or pouring is carried out in such a way that the gel substance is formed with a diameter of > 1 mm, preferably between 2 and 4 mm, and a height between 0.1 and 1 mm, preferably between 0.2 and 0.4 mm.

13. Process according to Claims 1 to 8, in which the dehydration process is carried out after pouring the solution to form a long strand.

14. Process according to Claims 1 to 13, in which the dehydration process is carried out after pouring the solution onto a base material.

15. Process according to Claims 1 to 14, in which the rehydration is carried out in tap water.

16. Process according to Claims 1 to 14, in which the rehydration is carried out in a saline solution.

17. Process according to Claim 16, in which a culture solution for the biologically active material is used as the saline solution.

18. Process according to Claims 16 and 17 using a saline solution containing polyvalent anions.

[Stamp:]
Revised sheet
IPEA/EP

19. Process according to Claims 1 to 18, in which the dehydration process is completely carried out during the time the created drop falls in a drop tower.

20. Mechanically highly stable biocatalyst of polyvinyl alcohol, produced according to the process according to Claims 1 to 19.

21. Biocatalyst according to Claim 20, produced in a lenticular form in which the diameter is significantly greater than the height.

22. Biocatalyst according to Claims 20 and 21 with a magnetic additive.

23. Process for producing a product created by transformation with a biocatalyst according to Claims 20 to 22.

24. Process according to Claim 23 for producing 1.3-propane diol.

25. Process according to Claim 24 for producing itaconic acid.

[Stamp:]
Revised sheet
IPEA/EP